

## ABSTRACT

A method and a system for decomposition of a multiple channel signal  
5 reflecting characteristics of a blood perfused fleshy medium is provided. This  
technique can be utilized for determination of at least one desired blood parameter.  
According to the method a portion of the medium is illuminated by  
amplitude-modulated light of more than two different optic channels having  
wavelength in a range where the scattering properties of blood are sensitive to light  
10 radiation. Further, a light response of the medium sensed, and the multiple channel  
signal is generated. Thereafter, the multiple channel signal is analyzed that  
includes: filtering the multiple channel signal and separating at least a part of  
multiple channels from each other, and providing time evolutions of the light  
responses of the medium for the part of said multiple channels. According to the  
15 invention, the amplitude-modulated light is activated in a composite mode regime  
employing a combination of parallel and serial modes. The filtering of said multiple  
channel signal and the separating of said multiple channels from each other both  
includes applying an adaptive resonator bank to the multiple channel signal.